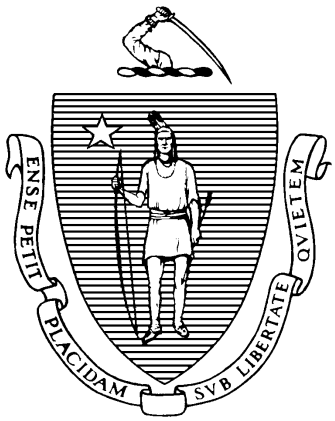
Evaluation of the

Environmental Results Program

Demonstration Project

November 13, 1997



The Commonwealth of Massachusetts
Paul Cellucci, Governor
Executive Office of Environmental Affairs
Trudy Coxe, Secretary
Department of Environmental Protection
David B. Struhs, Commissioner

The Massachusetts Department of Environmental Protection (DEP) created its Environmental Results Program (ERP) to develop a new and superior regulatory compliance system for the state's small and medium-sized businesses. While 25 years of command-and-control permitting has achieved significant environmental improvements in Massachusetts, the approach has in some ways been inefficient and ineffective.

For example, DEP has spent significant resources issuing air permits to some 4,400 facilities, of which two-thirds are small and medium-sized firms that together generate less than five percent of the state's total air pollution. Of the thousands of Massachusetts businesses required by law to obtain sewer discharge permits, only about 500 have done so to date.
Overall, DEP estimates that nearly two-thirds of the state's small and medium-sized businesses are out of compliance with at least some existing environmental requirements.

To address these realities, DEP developed ERP's whole-facility, performance-based compliance certification approach to replace traditional permitting. A primary objective of ERP is to focus the agency's limited resources where they will make the biggest difference: conducting audits and field compliance inspections.

In the summer of 1996, DEP began a year-long demonstration of ERP to test the new approach and learn lessons about how to effectively implement it on a broad scale. This document evaluates DEP field inspections at participating businesses both before and after the demonstration project began, the certifications submitted by those firms, and information gathered via interviews of officials at those companies.

Summary of Findings

The demonstration project indicated that:

- The Environmental Results Program (ERP) can improve both industry compliance rates and DEP's ability to protect public health and the environment. The overall compliance rate of participating firms jumped dramatically, from 33 percent in the spring of 1996 to 78 percent one year later.

- The certification process can prompt companies to make significant improvements in their environmental management systems.

- By eliminating the need for businesses to obtain or modify permits, the ERP approach gave participating companies more flexibility to make process changes, thus reducing the "time to market" for new products and removing one major regulatory obstacle to pollution prevention.

- Fewer permit reviews should allow DEP to focus more effectively on auditing and inspecting facilities to ensure their compliance with environmental requirements.

- Developing exclusively performance-based environmental standards will present some challenges, which DEP will address as it moves forward with the new approach.

Although the demonstration project was limited in scope, these results predict success for full ERP implementation.

What is ERP?

The Environmental Results Program (ERP) is a new regulatory mechanism for improving compliance at small and mid-sized industrial and commercial facilities. Under the program, DEP replaces the existing permitting process by establishing broad performance standards with which firms must certify their compliance. The intent of ERP is to better protect the environment and safeguard human health while making it easier, less time-consuming and less costly for companies to comply.

Regulated businesses need to:

- Commit that they will be held accountable to certain standards of environmental performance.

- Submit annual reports or "certifications" (signed under the pains of penalties and perjury by the highest-ranking corporate official) on their compliance with these standards.

In return, DEP concentrates on:

- Setting strict but achievable environmental standards tailored to each industrial and commercial sector.

- Doing more inspections and audits.

- Pursuing enforcement against companies not in compliance, to maintain a level playing field.

- Improving the quality of, and access to, compliance data so it will be more useful to DEP, companies and the public.

- Providing easy-to-understand, sector-specific compliance materials and educational programs, simplified reporting and record-keeping requirements, and incentives for pollution prevention.

The program also enables DEP to shift DEP resources away from permitting so they can be directed instead toward compliance and enforcement.

ERP Demonstration Project

DEP began laying the groundwork for the ERP demonstration project in February 1996 with 18 participating firms.[1] These companies were invited by DEP to participate because they were representative of the regulated community in Massachusetts that would ultimately be subject to ERP: small to medium-sized companies with mixed environmental compliance histories and varying degrees of complexity in their operations. These businesses ranged from dry cleaners and photoprocessors to manufacturers of printed circuit boards, pre-fabricated commercial storage buildings and plastic buckets.

During the demonstration project:

- DEP and company representatives worked together to create simple environmental performance standards, emission or discharged-based wherever possible, to replace existing case-by-case permit requirements for a variety of industrial processes.

- For one year (August 1996 through August 1997), participating firms were given flexibility to make operational changes without the need for new or modified permits, provided they otherwise remained in compliance with ERP demonstration project standards.

- Companies certified to DEP halfway through the year as to the status of their compliance with both ERP standards and a broad range of air, water and waste requirements applicable to their facilities.

- DEP conducted baseline inspections at all participating companies prior to demonstration project startup, then initiated a second round of inspections after certifications were submitted to determine changes in environmental performance.

- The agency interviewed officials at participating firms to gather feedback and analyzed inspection and certification data to assess program effectiveness.

Evaluation Goals and Results

[1] Originally there were 23 firms, but 5 ceased participation in the project prior to ERP certification in January 1997. One was suspended from the project due to environmental violations discovered in the pre-project baseline inspection, and another was suspended for failure to correct pre-project violations in a timely way (Because participating facilities were granted a limited enforcement forbearance for minor violations, DEP suspended any firm with serious violations or inadequate return to compliance to avoid abuse of the amnesty). One company decided to locate its unbuilt facility in another state, and one left the project because it did not feel benefits of the project outweighed the cost of participation (among other things, the company neither held nor needed any permits that ERP would render unnecessary and was concerned about how ERP certification might affect U.S. Food and Drug Administration rproduct approval). One firm's participation was put on hold due to an unresolved DEP policy question. A list of the demonstration project firms can be found as Attachment E.

The purpose of this evaluation is to provide an indication of how successful full ERP implementation might be. Specifically, DEP sought to learn during the demonstration project how the new approach might help the agency:

- Improve industrial compliance rates and better protect public health and the environment.
- Eliminate permit-related startup delays for companies and free DEP staff time for compliance assurance.
- Increase opportunities and incentives for pollution prevention.
- Develop a useable facility-wide certification process.
- Translate current site-specific permit requirements into easily understood, uniform performance standards.

Evaluation results are summarized below and outlined in more detail in the tables and supporting information that comprise the attachments to this document. Reported information and data were abstracted from DEP's inspection findings, analysis of certifications and interviews with company officials in the spring and summer of 1997.

■ The ERP approach appears to have significant potential to improve the environmental performance of participating firms.

There was dramatic improvement in compliance rates[2], based on a comparison of "before" and "after" inspections of participating facilities. The post-certification compliance rate of 78 percent is significantly better than both the pre-certification rate of 33 percent and the average statewide industrial compliance rate of 42 percent.[3] Improvements were noted across the board, both in meeting new standards created by ERP and in complying with long-standing regulatory requirements, such as hazardous waste management standards.

At the same time, two-thirds of the company officials interviewed (12 of 18) described the annual certification process as an excellent compliance education tool and reported that it helped them make positive changes in their firms' environmental management systems. (See table and Attachments A and B.)

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[2] For purposes of this report, compliance rate is the number of facilities found with no violations divided by the total number of facilities inspected — it does not consider nature, significance, nor number of violations. For future evaluation of ERP implementation, DEP will use other evaluation criteria that will compare environmental business practices and consider the significance of environmental problems found.

[3] A statewide compliance rate of 42 percent was found by DEP inspections at industrial facilities for the period from October 1, 1995, to September 30, 1996. Calculation of the pre-certification compliance rate did not include the five firms that departed ERP.

■ **ERP is likely to eliminate startup delays for new or modified operations, as well as reduce DEP permit review time.**

One ERP demonstration project firm made operational changes during the demonstration project year and was able to do so without needing to obtain a previously applicable DEP permit. This saved the company an estimated 60 hours of staff time, a $3,700 application fee, and a lengthy wait for DEP to complete its review and issue the permit. Since the firm was still required to meet strict ERP performance standards, environmental protection was not compromised. Furthermore, eliminating the permit review also resulted in a time savings for DEP. (See Attachment B.)

None of the other participating businesses made changes to their operations that would have allowed them to take advantage of ERP's flexibility

■ **ERP may increase opportunities and incentives for pollution prevention.**

A substantial majority of the participating company officials interviewed (12 of 18) agreed that flexibility to make process changes without needing to obtain or modify DEP permits amounted to an incentive to implement pollution prevention. However, some (five of 18) viewed it as was neither an incentive nor a dis-incentive. (See Attachment B.)

In the two industrial sectors chosen by DEP for initial ERP rollout[4], performance standards such as leak checking and repair (dry cleaners) and closed-loop silver recovery (photoprocessors) are, themselves, pollution prevention. Other techniques are encouraged throughout the compliance assistance workbooks developed for these industries. It should be noted that business sector-specific workbooks, to be a cornerstone of full-scale ERP implementation, were not available at the time of the demonstration project.

■ **DEP can develop a useable facility-wide certification which has significant environmental benefits. The process can be time-consuming for companies, however, and first-time certifiers may have high error rates.**

The facility-wide certification process developed for the ERP demonstration project appeared to have very positive impacts on participating companies' environmental management systems, performance and practices. These benefits came at a cost, however. When asked about the cost impact of the certification process above and beyond the routine time spent on environmental compliance matters, many companies (7 out of 18) reported "insignificant" costs while others spent from 15 to 200 hours of staff time. Two of the demonstration firms reported the use of outside consulting services.

Additionally, the process was complex enough that even with easy access to one-on-one compliance assistance from DEP, 39 percent of the certifications submitted had administrative

[4] For additional information on ERP rollout to specific industrial and commercial sectors, see *Moving Forward* at the end of this summary.

and/or technical errors, and the same proportion were submitted late. About half of the errors were significant in nature.

The first-time error rate is comparable with the rate of deficiency in DEP's traditional permitting programs. Last year, 41 percent of all applications for industrial wastewater permits, 31 percent for air quality program and 21 percent for hazardous waste, including both first-time applications and renewals, were found to be administratively and/or technically deficient. The ERP demonstration project error rate is also similar to that found in other DEP compliance certification programs. For example, approximately 30 percent of the first-time filers in the agency's autobody shop program submitted certifications containing deficiencies or errors. (See Attachments B and D.)

■ It is difficult to develop performance standards containing only discharge or emission limits and, in some cases, alternative standards are preferred by businesses.

Emission and/or discharge limits were established for ten of twelve industrial processes for the ERP demonstration project firms. At the same time, the majority of these standards also specified material, equipment and/or operating requirements (e.g. low-solvent paint, high-efficiency spray nozzles, or frequency of checking for leaks). While discharge or emission-based standards can maximize operational flexibility, certain businesses (such as dry cleaners and photoprocessors) view equipment standards, for example, as less burdensome. In other words, these companies would rather be held to a prescribed equipment maintenance routine than to be held responsible for monitoring the actual discharges or emissions from their equipment.

Relying exclusively on emission and/or discharge limits also requires a considerable investment of DEP staff time on researching the latest national and international advances in regulatory standard-setting and low-cost continuous monitoring equipment. Despite these challenges, DEP managers have expressed confidence in the agency's ability to move closer to standards that are solely discharge or emission-based as it moves forward with full ERP implementation.

Interpreting the Results

Data collection, sample size, evaluation methodology and inherent differences between the demonstration project and full ERP implementation may limit the applicability of these findings to subsequent rollout. Anecdotes can be valuable additions to data and other documented evidence, but they are subjective by nature.

Participating companies' performance in and reaction to the demonstration project may not be representative of the regulated community experience as a whole under full ERP implementation. The sample size was small (18 firms), companies were not randomly chosen (participation was voluntary), they received one-on-one assistance from DEP and were notified of inspections in advance.

Despite these factors, however, compliance rates found during the "before" inspections were typical of Massachusetts industry as a whole. Other differences between the demonstration

project and ERP rollout that could improve program effectiveness include DEP's introduction of enhanced compliance assistance tools, such as workshops, clinics, written guidance and workbooks.

Moving Forward

Two business sectors were included in the initial statewide rollout of ERP in 1997. First-ever annual compliance certifications were due from 900 dry cleaners and 650 photoprocessors in September. DEP is currently reviewing what they submitted, as well as preparing for enforcement follow-up with non-filers and other suspected violators. At the same time, the agency is finalizing regulations for the next business sector to be included in ERP: commercial printing. DEP estimates that about 3,000 Massachusetts companies are engaged in this business. In 1998, ERP will be expanded to encompass companies that discharge industrial wastewater to sewers and those firms either installing or modifying boilers.

Thus, thousands of companies in Massachusetts that until now have required DEP permits are currently, or will soon be, shifting to performance-based, facility-wide compliance self-certification. ERP's ultimate goal is to eliminate the need for some 10,000 small and medium-sized industrial and commercial businesses in the state to obtain, modify or renew environmental permits. It will also make DEP a more efficient and effective guarantor of the people's constitutional right to a clean, healthy and safe natural environment.

The following table displays evaluation criteria with measures of success for these criteria.

Evaluation Results:

Evaluation Criteria	Results
Improved compliance	
• Compare pre- and post-certification compliance rates	• Pre-certification compliance rate: 33 percent (6 of 18), post-certification compliance rate: 78 percent (14 of 18). (See Attachment A)
• Company feedback re: compliance benefits	• 12 of 18 reported environmental management systems and practices improved. (See Attachment B) • 10 of 18 reported ability to comply improved. (See Attachment B)
Translate current site-specific permit standards into uniform emission-based performance standards	
• How many of the 12 standards were emission/discharge-based performance standards?	• 10 of 12 standards included emission/discharge limits, however, all 12 also contained material, equipment & operating standards. (Attachment C)
Eliminate start-up delays for the firms caused by the permitting process and eliminate permit review time for DEP	
• Number of firms able to make changes without permits that would have been needed pre-ERP, and estimates of resulting cost/time savings to firms and DEP.	• 1 of 18 firms made changes that would have triggered permits pre-ERP. This firm reports savings of: $3,700 in fees, 60 hours of company staff time, and avoided months of permit approval wait time. None of the other firms made changes to operations during the project year.
Increase opportunities and incentives for pollution prevention	
• Company feedback regarding ERP's impact on their ability to implement pollution prevention.	• 12 of 18 reported improved ability to implement pollution prevention, 5 reported no impact, and 1 reported some positive and some negative impact. (See Attachment B)
Develop a (useable) facility-wide certification	
• Data on certifications received: number late, number incorrect, and types of errors.	• 39 percent (7 of 18) were incorrect • 4 errors significant/3 administrative • 39 percent (7 of 18) certified late (See Attachment D)
• Company feedback regarding consultant use & staff time/money spent on filling out certification.	• 2 reported use of consultant • 7 reported insignificant costs • 2 reported cost of $1,000

Evaluation Criteria	Results
	• 3 reported 10-40 staff hours • 2 reported 80 to 200 hours • 1 reported cost of $15,000 • 3 had no cost data (See Attachment B)

Attachment A

"Before" and "After" Inspection Findings
Environmental Results Program Demonstration Project Evaluation

Before ERP	After ERP
Spring 1996: 12 out of 18 (67%) firms were in non-compliance:	**Spring 1997: 4 out of 18 (22%) were in non-compliance: ****
12 firms: Improper hazardous waste (HW) management/storage/labeling (e.g. open/improper containers, lack of accumulation area signs/marking, un-labeled containers).	4 firms: Improper hazardous waste (HW) management/storage/labeling (e.g.. Open/improper containers, lack of accumulation area signs/marking, un-labeled containers).
7 firms: Not meeting HW emergency preparedness and training requirements (e.g.. Inadequate staff training, lack of contingency plan, lack of emergency information)	2 firms: Not meeting HW emergency preparedness and training requirements (e.g.. Inadequate staff, lacking of contingency plan, lack of emergency information).
*4 firms: Lack of state industrial wastewater (IW) sewer connection permit.	
2 firms: Unregistered Toxic Use Reduction Act (TURA) Large Quantity Toxics Use (includes lack of TURA plan & fees).	
2 firms: Generating HW out of status (e.g.. Small Quantity Generator who was storing Large Quantity Generator amounts on site).	2 firms: Generating HW out of status (e.g.. Small Quantity Generator who was storing Large Quantity Generator amounts on site).
2 firms: Unregistered HW generation.	
*2 firm: Lack of air quality (AQ) permit.	
*2 firms: Lack of permit/registration for on-site HW recycling.	
*1 firm: Burning waste oil not covered by air permit.	
*1 firm: Failure to maintain AQ emission records in accordance w/AQ permit.	
1 firm: Incomplete AQ emission statement.	
1 firm: Generating waste w/out HW determination.	1 firm: Generating waste w/out HW determination.
1 firm: Lack of IW treatment plant operation/maintenance manual.	2 firms: Lack of IW treatment plant operation/maintenance manual. (ERP standards)
1 firm: Inadequate IW treatment plant staffing.	2 firms: Inadequate IW treatment plant staffing. (ERP standards)
1 firm: Failure to meet AQ equipment standards.	
1 firm: Improper storage of volatile organic compounds.	
1 firm: Failure to meet water supply cross-connection standards.	
	2 firms: Lack of IW treatment plan grading. (ERP standards)
	1 firm: Incorrect HW EPA identification number.
	1 firm: Failure to meet ERP AQ emission limit ERP standards.
	1 firm: Failure to meet with ERP IW monitoring standards.
	1 firm: Failure to meet ERP IW record-keeping standards.

* Return to compliance with the asterisked violations above was waived during the Round 1 inspections of the demonstration project because the requirement is subject to change under ERP.

** For one demo firm, the Round 2 inspection was at a different facility than Round 1 because the actual facility participating in the project was not constructed until after Round 1.

Attachment B

Demonstration Project Firm Interview Results

In the spring and summer of 1997, DEP conducted interviews at each of the ERP Demonstration Project firms. The following is a summary of responses to the questions most closely linked to the demonstration project evaluation criteria.

1) Were environmental management structures changed, created, or eliminated as a result of your company's participation in the certification process?

- 12 out of 18 reported changes to environmental management structures. These included:

  9 reported enhancement to environmental policies and procedures.

  4 reported increases in environmental staffing.

  3 reported increased access of environmental managers to formal business decision making.[5]

  2 reported increases in environmental training.

  2 reported increased budget for environmental management activities.[6]

2) Did going through the certification process help you identify, for the first time, rules your operation is subject to? Did it help you get into compliance with them?

- 10 of the 18 firms said the certification process was helpful in identifying and complying with applicable rules.

3) Did ERP have a positive or negative impact on your ability to implement pollution prevention?

- 12 out of 18 said it would have a positive impact.

- 5 said it would have no impact.

- 1 said it would have some positive impacts (increased flexibility to make process changes, including pollution prevention) and some negative impacts (when there is an emission

Attachment B
(Continued)

[5] Many of the smaller companies have no "environmental manager," therefor this question did not apply.

[6] Most firms reported that they had a flexible budget for environmental matters where they ask for budget increases as needed.

cap firms can pollute up to that cap, and by removing the burden of permits you thereby remove an incentive to do pollution prevention).

4) Did you employ consulting firms to complete the certification?

- 1 employed an environmental management consultant.
- 1 employed a legal consulting firm.

5) Estimate the cost impact on your firm from the certification process, over and above the routine time spent on staying in compliance.

- 7 Companies: Reported "Insignificant Costs"
- 3 Companies: Data not available.
- 2 Companies: $1,000.00
- 1 Company: $15,000.00 (primarily for legal consulting)
- 1 Company: 100-200 hours staff time
- 1 Company: 80 hours staff time
- 1 Company: 40 hours staff time
- 1 Company: <24 hours staff time
- 1 Company: 10-15 hours staff time

ATTATCHMENT C

Environmental Results Program Demonstration Project Standards				
Industrial Processes	**Emission/Discharge Limits** - lbs of pollution - ppm in discharge X volume discharges	**Material Specifications** - % sulfur concentration in fuel - % VOC in solvents	**Equipment Design Specifications** - spray nozzles - stage II vapor recovery systems - freeboard height - equipment type	**Equipment Operating Procedure/ Compliance Management Practices** - temperature - application rate - production rate - trained operators - frequency of changing filters -keeping covers closed - labeling - material handing procedures - emergency response plan - worker notification - frequency of checking for leaks
Adhesion Process	X	X	X	X
Combustion				
- Fossil Fuel	X	X	X	X
-Used Oil Fuel	X	X	X	X
Degreasers				
-Batch Cold Cleaning		X	X	X
-Batch Vapor		X	X	X
-Conveyorized		X	X	X
-Subject of NESHAPS		X	X	X
Dry Cleaning	X		X	X
Non-Paper Printing	X	X	X	X
Surface Coating Operations	X		X	X
Biotechnology	X			X
Photo Processing	X		X	X
Polymerization	X			X
Pretreatment				X
Sewer Connection	X			X
Zero Discharge Units	X	X	X	X

<--Performance----------
----------Command & Control-->
Standards Standards

September 10, 1997

Attachment D

Analysis of Certification Errors
(from the January 1997 Full Certification)

11 of 18 Certified on time.

- 3 of the late filers certified within 5 days of the deadline without prompting from DEP.

7 of 18 Certification errors.

- 4 contained significant errors:
  - 2 were missing compliance status information, but contained applicability information.
  - 1 was missing their return to compliance plan for a self-reported violation.
  - 1 was missing a few applicable schedules.
- 3 contained minor administrative/completeness errors:
  - 2 were missing 1/97 applicability data but included 8/96 applicability data.
  - 1 was missing reference information on a minor permit, but compliance information was provided.

Attachment E

Environmental Results Program Demonstration Project
Participating Firms

60 Minute Photo, Springfield

Alkermes, Inc., Cambridge

American Durafilm, Holliston

Anton's Cleaners, Inc., Tewksbury

C. P. Clare - Semiconductor Group, Beverly

CVS, Springfield

Fenwal Electronics, Milford

Genzyme, Framingham

Komtek, Worcester

Lewandos, Needham

Package Industries, Sutton

Plastican, Inc., Leominster

Plating for Electronics, Waltham

Presmet Corporation, Worcester

Printed Circuit Corporation, Woburn

Sippican, Inc., Marion

Waters Corporation, Milford

Whyte's Cleaners, Lynn